In conclusion, it may be stated, from the present study, that abscess of the pancreas may occur in persons of intemperate habits, of the male sex, and after the age of forty. It may be almost entirely latent, or present the only positive symptoms of emaciation, constipation, and pressure phenomena, and, doubtfully, of despondency and skin bronzing.

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ON SOME POINTS IN THE PRACTICE OF ARTIFICIAL RESPIRATION IN CASES OF STILLBIRTH AND OF APPARENT DEATH AFTER TRACHEOTOMY.

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THE subject of artificial respiration is naturally preceded by a few words on stillbirth. That the popular use of "stillbirth" as synonymous with "deadbirth" is incorrect, is proved by the generally used and quite correct phrase "resuscitation of stillborn children." If the children are dead, they obviously cannot be resuscitated. Again, the phrase cannot mean birth without any of the signs of life, for, speaking generally, the heart is beating. The expression, then, practically comes to mean birth without obvious movements, whether of respiration or of other kinds. This, after all, is the plain meaning of the word "still." All deadborn children are therefore stillborn, but all stillborn children are not deadborn.

A child born alive but "still"—that is, generally, but not necessarily, with its heart beating, but without movement—may be in one of two stages or states, for the description of which we are indebted to Cazeaux.[1] In the first, which he calls the "apoplectic state," the surface is livid, but the muscular tone is not lost, and there is no response to reflex irritation. In the second, which he calls "syncope," the surface is pale, the muscular tone is lost, and there is no response to reflex irritation. These two states are also known as the livid stage and the pale or flabby stage of asphyxia.

The relation of these two stages to each other is not finally determined. It is known that the head of the fœtus is subjected to great pressure in its passage through the genital canal, and that hemorrhages into the brain and spinal cord are so commonly[2] found in the bodies of children born dead or dying soon after birth, that it is probable that such hemorrhages are by no means invariably fatal. No necessary connection apparently exists between serious lesions of this sort and stillbirth, in the sense that in cases of dangerous stillbirth such lesions are necessarily present. Moreover, the worst cases of both varieties occur where the head is born last, and has, therefore, suffered less pressure than usual.

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[1] Cazeaux, Gaz. méd., 1850, No. 17, p. 317, and Traité des Accouchements, Bruxelles, 1845, p. 34.

[2] Litzmann, Die Geburt bei engen Becken, Leipzig, 1884 (passim).

The state of asphyxia at birth is an exaggeration of the state of strong "necessity of breathing," which is normally produced during labor. As the intrauterine pressure rises, and the placenta is pressed upon with increasing force, as the placental site diminishes with uterine retraction, the fœtal circulation becomes progressively embarrassed, the external sign of which is retardation of the fœtal heart. The complete or virtual abolition of the placental circulation which generally ensues on the completion of the birth of the child, and the shock of the relatively cold air, may either of them be competent to excite the first inspiration. Sometimes, however, matters have gone further, and the child is too asphyxiated for the moment to be roused. On the other hand, pressure on the cord, or separation or great squeezing of the placenta (such as occurs in head-last cases, when the head is in the vagina, and the uterus is already in the third stage of labor before the child is born) may excite premature inspiratory efforts, convulsive in their nature, which may draw any matters in the genital passages, such as liquor amnii, vernix caseosa, and meconium, not only into the trachea, bronchi, and air cells, but even beneath the pleura. In such a case the child, resuscitated it may be, dies of a low form of lobular pneumonia.

The length of survival of apparently dead children is sometimes remarkable, as the following instances, in which children have been buried apparently dead, and afterward dug up and restored to life, show.[1] Two illegitimate children of separate mothers were buried, and restored to life after several hours' burial. A child was buried five hours, restored to life, and lived three days.[2] A child was buried in a field twenty-five centimetres below the surface during eight hours; it lived four days after its disinterment.[3] A child was born apparently dead; attempts to revive it proving fruitless, it was laid on a bed for several hours, and then put in a coffin. Twenty-three hours after birth it was seen, and, to make matters certain, the stethoscope was applied to the cardiac region, and heart sounds were heard. All attempts to revive it, however, failed, and it died. Such a case as the last suggests the greatest caution, the more so as the body has been opened under similar conditions, and the heart found beating.

The *prognosis* in cases of stillbirth is of the utmost importance as a guide to treatment, but it is not usually made. To attempt to resuscitate a child which is actually dead is useless; though, if the child is fresh, attempts may even here be made for a short time, for the satisfaction of the parents. The certainty of death in the case of fresh children depends on the certainty of the cessation of the heart's action during a considerable period, for the heart may cease to beat for a time, apart from absolute death. In such a case, when the heart has ceased to beat for a considerable time (say ten to fifteen minutes), it might be well cautiously to insert a needle into its apex, before abandoning all efforts at resuscitation.

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[1] Bohn, "De officio medici forensis," S. 262 (quoted by Schultze).

[2] Bardinet, Bull. de l'Acad. Imp., tom. xxx. p. 1052, No 21, 15 août, 1865 (quoted by Schultze).

[3] Maschka, "Das Leben der Neugeborenen ohne Athmen," Prager Vierteljahrschrift, 43, p. 1, 1854.

The question here arises, How long should attempts at resuscitation be continued on the sole ground of the persistent action of the heart? A child whose neck is broken, and who dies eventually with considerable effusion of blood into its spinal cord and brain, has been yet revived and lived for several hours. The case above quoted, in which the heart was found beating twenty-three hours after supposed death, should also be borne in mind. In children who eventually die, the heart revives for a time under artificial respiration, and can be kept beating for some (*e. g.*, two) hours, though the child never draws a breath. Such a case, however, is practically hopeless. It may be stated that if no attempts at spontaneous breathing occur within an hour, and especially if the heart, in spite of artificial respiration, acts with diminishing strength and frequency, the prognosis becomes hopeless.

The second point in the prognosis depends on the diagnosis of the state of asphyxia. In the livid stage the prognosis is usually favorable. It is in itself the less serious form, and possesses the great advantage of retaining the power of reflex excitability. If the heart is beating fairly, it is often sufficient to lay the child on its face, wipe out its mouth, and rub it along the spine, a far better way of exciting an inspiration than slapping the nates. A livid color in a stillborn child is, therefore, a good sign. In the pale or flabby stage of asphyxia the prognosis is far more serious. These are the cases which require all the skill at our disposal, while the slight cases will recover under any treatment, and generally better without any artificial respiration at all; it is these latter cases which form the bulk of those recorded in the journals as "successful treatment of suspended animation by a new method."

In the cases of pale or flabby asphyxia, the prognosis depends on our power to raise the child out of its flabby condition, and render it amenable to reflex irritation. Until this is done, all rubbing, slapping, bathing, etc , are simple waste of time. While the heart beats regularly, we may still hope for recovery up to a reasonable length of time, as we have observed above.

The state of the pupils furnishes an important element in prognosis. In profound asphyxia they are widely dilated, as in death. The reestablishment of the circulation produces no effect on them, but on the reëstablishment of respiration they at once contract.[1]

If the child is breathing, its respiration may be spasmodic, regular, or mixed, periods of spasmodic and regular respiration alternating. The spasmodic respiration is imperfect respiration, but is gradually replaced in most cases by rhythmical respiration, and the prognosis is good. If spasmodic breathing replaces regular breathing, the reverse is, of course, true.

A few words may here be said on the vexed question of the treatment of the navel-string. It appears that a child gains some four to six ounces of blood after birth, the principal object of which is probably to furnish an additional supply for the newly established pulmonary circulation. This blood is not forced into its body so much as drawn into it by the first inspirations. To deprive a child of seven ounces weight of this amount of blood is the same thing as to deprive an adult, weighing ten stone, of five to seven and a half pounds of blood—a very serious bleeding. In ordinary cases, therefore, it is best to tie the cord late. In cases of asphyxia the same rule holds good, unless manipulations are indicated which require the child to be free from its mother.

It has been recommended, in cases of livid asphyxia, to allow half an ounce to an ounce of blood to escape from the cord. This treatment is probably founded on the full-blooded appearance of the child. The child, however, has *less* blood than it should eventually have, and has no more than a child ~~in the pale stage, the difference being~~ one in the distribution rather than the amount of blood. Remembering that these livid children generally recover, and that the treatment has never been suggested for the pale children, who are the really serious cases, it is probably best, in the meanwhile at least, not to bleed.

The color of the skin, and especially of the lips, is important, whether tending to lividity or to pallor, and a favorable change often precedes the establishment of respiration.

With regard to artificial respiration, it may be stated that four objects are aimed at, namely:

(1) Removal of foreign bodies from the air-passages;
(2) Procuring the patency of the air-passages;
(3) Excitation of the circulation;
(4) Ventilation of the lungs.

(1) With regard to the first,[2] the mouth, and, as far as possible, the air-passages, should be cleared before inspiratory movements are excited, in order to prevent the liquor amnii, meconium, vernix caseosa, and other matters from being inhaled into the lungs. The best method to pursue is the following: Lay the child on its back, with the head hang-

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[1] Boehm, Arch. für exp Path und Pharm., Bd. viii. S. 91.
[2] Med.-Chir. Trans., vol lxvii. pp. 105–113, 1884.

ing over the edge of a table, a little lower than the rest of its body. Wipe out the mouth with a soft handkerchief. Press the thorax gently with one hand, stroking the trachea upward with the other, and retain the finger at the top of the trachea until the next manœuvre is complete. The mucus will gravitate toward the posterior nares. Put a handkerchief over the child's mouth, blow gently, and the mucus will be blown out of the nostrils, but not into the operator's face.[1]

If there is great accumulation of mucus in the air-passages, a No. 9 gum-elastic male catheter should be introduced into the trachea, so that the point is three and a half inches from the lips. This length will secure its passing through the glottis, but not as far as the bifurcation of the trachea. Press the thorax gently with one hand to prevent the entrance of air, and blow through the catheter. The opening being low down in the trachea, the air and mucus with it being unable to pass into the lungs on account of its compression by the hand, will rush up through the glottis, and the mucus will be blown into the pharynx. This can be repeated as often as necessary, the general tendency of fluids in the air-tubes being to ascend during respiration, whether natural or artificial, toward the mouth. This manœuvre is more efficient and far pleasanter than the suction usually recommended; it has answered well in practice.[2]

(2) With regard to securing the patency of the air-passages; this is often the greatest difficulty in artificial respiration, particularly where the child is deeply asphyxiated, and the ~~divaricator muscles of the~~ glottis seem to share the general flaccidity of the muscles of the whole body.[3] All methods of artificial respiration by manipulation, except that of Schultze, seem to be often useless, on account of this condition; the method of Schultze, however, seems by some means to render the air-passages patent in many cases where they have remained closed during other manipulations.[4] To pull the tongue forward with forceps is useless, as it does not affect the structures at the base of the tongue, and does not raise the epiglottis. The manœuvre of tilting up the chin with the mouth closed, however useful in adults, permitting respiration solely through the nose, as it does, cannot be of the same use in stillborn children, whose pharynx and air-passages are filled with mucus, and in whom the removal of mucus is one of the great desiderata.[5] Hanging the head backward over the edge of a table does not provide for the patency of the upper air-passages.[6] If difficulty is persistently experienced, a catheter can be introduced into the trachea, and secured at the proper length of three and a half inches, so that it may not slip too far in, or slip out during manipulations. While in the trachea it serves for various purposes, among which is the removal of mucus as described

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[1] Med.-Chir. Trans., vol. lxvii. p. 110, 1884.

[2] Ibid.

[3] Ibid., p. 109, 1884.

[4] Ibid.

[5] Ibid.

[6] Howard, Lancet, May 22, 1880, p. 797.

above. During artificial respiration fluid will often pour from the catheter, especially if it is held over the edge of the table like a siphon.

(3) The third object, excitation of the circulation, is generally dependent on the fourth, namely, ventilation of the lungs.[1] But pressure over the præcardium has a direct effect in raising the blood-pressure and exciting the action of the heart. This is probably the chief reason for any success obtained by the methods of Howard and Marshall Hall, which are powerless[2] to introduce air into the lungs of stillborn children. It has been said that it is undesirable to excite the circulation in deeply asphyxiated children, since the blood which is supplied to the body is necessarily impure. This objection, however, is theoretical, the truth being that the revival of the circulation gives the best prognosis for the establishment of respiration.

(4) The ventilation of the lungs is secured by various methods of manipulation, of which, for stillborn children, only two are trustworthy,[3] namely, the method of Schultze, and that of Silvester, with its modifications by Pacini and Bain.[4] It may be said at the outset that the method of Silvester (and its modifications), though the best for general purposes, by no means imitates the natural breathing of an infant, which is diaphragmatic.[5] In the method of Schultze, on the other hand, the diaphragm descends, though but slightly. The chief effect of both methods is to raise the upper part of the thorax. There remains the method of mouth-to-mouth inflation, the object of which is to fill the lungs once for all.

These methods will now be described.

A. The method of Schultze.[6] The navel-string being tied, the child is seized with both hands by the shoulders in such a way that both thumbs lie on the anterior wall of the thorax, both index fingers extend from behind the shoulders into the axillæ, and the other three fingers of both hands lie obliquely along the posterior wall of the thorax. The head is prevented from falling by the support of the ulnar sides of the two hands. The operator stands with somewhat separated legs, and bends slightly forward, holding the child, as above described, at arm's length, hanging perpendicularly. (*First position, inspiratory.*)

Without pausing, he swings the child upward from this hanging position at arm's length. When the operator's arms have gone slightly beyond the horizontal, they hold the child so delicately that it is not violently hurled over, but sinks slowly forward and forcibly compresses the abdomen by the weight of its pelvic end. (*First movement, expiratory.*) At this moment the whole weight of the child rests on the operator's thumbs lying on the thorax. (*Second position, expiratory.*)

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[1] Boehm, loc. cit., S. 72 et seq.

[2] Med.-Chir. Trans., vol. lxiv p. 85, 1881.

[3] Ibid., pp. 85, 86.

[4] Ibid., p. 79.

[5] Ibid., pp. 64, 65, 82.

[6] Schultze, Der Scheintod Neugeborener, Jena, 1871, S. 162. Ibid., p. 48.

Any compression of the thorax by the hands of the operator must be carefully avoided. The body of the child rests during the first position with the floor of the axillæ on the index fingers of the operator exclusively, and no compression should be exercised on the thorax in spite of the support of the hands to the head, nor should the thumbs compress the thorax in front. When the child is swung upward the spinal column should not bend in the thoracic, but only in the lumbar region, and the thumbs should not at this time strongly press the thorax, but should only support the body as it sinks slowly forward. The raising of the body as far as the horizontal should be effected by a powerful swing of the arms (of the operator) from the shoulders, but from that point the arms should be raised more and more slowly, and by means of a delicately adjusted movement of the elbow-joints and scapulæ on the thorax, the pelvic end of the child should fall gradually over. By this gradual falling of the child's pelvis over the belly, considerable pressure of the thoracic viscera is exercised, both against the diaphragm and the whole thoracic wall. At this point the inspired fluids often pour copiously from the respiratory openings. After the child has slowly but completely sunk over, the operator again lowers his arms between his separated legs. The child's body is thereby extended with some impetus; the thorax, released from all pressure (the operator's thumbs lying now quite loosely on the anterior walls of the chest), expands by means of its elasticity, but the weight of the body hanging, as it does, on the index fingers of the operator by the upper limbs, and thus fixing the sternal ends of the ribs, is brought into use for the elevation of the ribs with considerable impetus; moreover, the diaphragm descends by virtue of the impulse which is communicated to the abdominal contents.

(*Second movement, inspiratory.*) After a pause of a few seconds, in the first inspiratory position, the child is again swung upward into the previous position (*first movement, second position, expiratory*), and while it sinks slowly forward it brings its whole weight to bear on the thumbs, which rest on the anterior thoracic wall, and mechanical expiration again ensues. At this point any inspired fluids always pour copiously from the mouth and nose, and generally meconium from the anus. The proceeding is repeated eight or ten times a minute, but more slowly when the inspired fluids flow from the mouth and nose.

It is most important that at the end of the respiratory movement the weight of the child's body should be entirely thrown on the index fingers placed in the axillæ, and none of it supported by the rest of the hand.

Schultze's method has the disadvantage of being more[1] sudden and violent than some of the other methods, but this can be largely controlled by the operator. On the other hand, it possesses two great advantages: the first is, that in the expiratory position the child is inverted, and gravity assists in removing mucus and other bodies from the air-passages; the other is, that for some reason it does sometimes actually provide patency of the air-passages where other methods fail.[1]

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[1] Med.-Chir. Trans., 1881, vol. lxiv. p. 81.

The method of Schultze has recently been assailed on the ground that it fails to introduce air into the lungs. It would be very difficult to devise an experiment which would prove or disprove this.

In the experiments on stillborn children referred to above, tracheotomy had been performed and a canula tied into the trachea, which really removes the chief impediment to the introduction of air in actual practice, such impediment concerning almost exclusively the upper air-passages. As regards the results of autopsies, it must be remembered that the presence of a certain amount of air in the lungs of a stillborn child would not prove its introduction by artificial respiration, since the lungs of children dying *intrapartum* are not necessarily airless,[2] but complete, or even considerable expansion of the lungs of a stillborn child after artificial respiration would certainly prove that air had been introduced by such artificial respiration. It is doubtless true that in some cases all methods will fail, and that all manipulative methods often fail in the case of premature or undersized infants, unless, indeed, the patency of the upper air-passages is secured. It is not enough to prove that in some cases a method succeeds—what is desired is to know the best methods and what to expect of them. The result of considerable experience of all methods of artificial respiration in practice has been to assign to Schultze's method one of the highest places as a means of securing the ventilation of the lungs, and the highest place among manipulative methods as a means of securing patency of the upper air-passages.[3]

B. The method of Silvester,[4] recommended by its author for children and adults: (1) To adjust the patient's position, place the patient on his back, with the shoulders raised and supported on a folded article of dress; (2) to maintain a free entrance of air into the windpipe, draw the tongue forward; (3) to imitate the movements of respiration raise the patient's arms upward by the sides of his head and then extend them gently and steadily upward and forward for a few moments, next turn down the patient's arms and press them gently and firmly for a few moments against the sides of the chest; (4) the feet are to be secured, and the arms are to be stretched steadily upward for two seconds.[1] The arms should, if possible, be everted, which gives a greater inspiratory power, by rendering more tense the tendon of the pectoralis major muscles, and they should be seized above the elbow.

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[1] Med.-Chir. Trans., 1884, vol. lxvii. p. 109.

[2] Schwartz, Die vorzeitigen Athembewegungen, Leipzig, 1858, S. 136 (Cases 15 and 30). Schultze, loc. cit., S 132 Hecker, Virch. Arch., 1859, xvi. S. 534.

[3] Med.-Chir. Trans., 1884, vol. lxvii. p. 109.

[4] Silvester, "The true physiological method of restoring persons apparently drowned or dead, and of resuscitating stillborn children," 1858, p 17. Med.-Chir. Trans., 1881, vol. lxiv. p. 46.

The modifications by Pacini and Bain are as follows. That by Pacini[2] is thus described:[3] The feet of the patient being fixed, the operator stands with the head against his own abdomen, and then with his hands takes a firm hold of the upper part of the arms, applying the forefingers behind and close to the armpits, while the thumb is in front of the head of the humerus. Holding the shoulders thus, he pulls them toward him, and then lifts them in a perpendicular direction.

Bain's modification[4] is the following.[5] First method: The fingers are placed over the front of the axillæ, the thumbs over the ends of the clavicles; the operator then draws the shoulders upward and then relaxes his traction. Second method: The shoulders are raised by taking hold of the hands and raising the body about a foot off the table, the position of the arms being at an angle of about forty-five degrees beyond the head. These modifications present no practical advantages over the original method of Silvester for children; in adults they seem to increase slightly the amount of air inspired.[6]

The advantages of Silvester's method are its simplicity and the comparatively large amount of air which it is capable of drawing into the lungs. Its disadvantages are that the supine position of the patient impedes the escape of mucus and other matters from the mouth, and also the fact[7] that it frequently happens that the collapsed state of the upper air-passages prevents the introduction of any air into the lungs.

The methods of Marshall Hall[8] and Howard[9] are incapable of introducing any air into the lungs of a stillborn child, because the chest has no resiliency, and any effect they may ever produce in resuscitating stillborn children must be produced by pressure on the heart, which has the power of stimulating its action and raising the blood-pressure.[10]

We have now to say a few words on direct inflation of the lungs. Various curved canulas have been invented for this purpose, especially in France, but we cannot recommend their addition to the already large armamentarium of the accoucheur; and, if used at all, they must be constantly carried, for their need arises unexpectedly. The best method is that by the mouth. The operation may be rendered clean by the simple method of laying a towel over the child's mouth and breathing through it. The disadvantages of direct mouth-to-mouth inflation are alleged to be the following: (1) Danger of rupturing the lungs; (2) danger of tubercular infection from the operator; (3) danger of inflating the stomach, and so preventing inspiration by impeding the descent of the diaghragm.

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[1] Med.-Chir. Trans., 1881, vol. lxiv. pp 79 and 86.

[2] Ibid , 1881, vol. lxiv. p. 47.

[3] Pacini, "Di un novo Metodo di practicare la Respirazione artificiale," Firenze, 1867.

[4] Med.-Chir. Trans., 1881, vol. lxiv p. 47.

[5] Bain, Med. Times and Gazette, Dec. 19, 1868, p. 708.

[6] Med -Chir. Trans , 1881, vol lxiv. p 75.

[7] Ibid , 1884, vol. lxvii. p 109.

[8] Ibid., 1881, vol. lxiv. p. 78.

[9] Ibid., p. 77.

[10] Boehm, Arch. für exp. Path. und Pharm., Bd. viii. S. 91.

The first can be avoided by gentleness in inflating, and also by leaving the nose free.[1] To close the nostrils, as is often recommended, is useless and dangerous—the nostrils are a valuable safety-valve. The second is founded on an observation by Reich,[2] relating to a consumptive midwife who practised inflation. In thirteen months twelve children delivered by her were attacked with symptoms of bronchial catarrh with fever, and died of tubercular meningitis. The children had no phthisical family history. During the same period the other midwife of the place had no cases of tubercular meningitis. In the nine years previous to the practice of the phthisical midwife there had been only two cases, and in the year after her death only one.

In view of recent researches on tubercle, the above has at least to be remembered. The third is imaginary, so far as artificial respiration is concerned;[3] air in the stomach is no way diminishes the amount of air which can be introduced into the lungs by the artificial methods, and it is easily pressed up from the stomach.

It has been suggested that the entrance of air into the stomach can be prevented by pressing the cricoid cartilage against the bodies of the vertebræ, and also by bending the head well back.[4] Neither of these plans produces the desired effect in children, though the former succeeds in adults.[5]

It remains for us to say a few words on the action of heat. In this matter it is necessary to keep apart the two questions of (*a*) recovery to respiration, and (*b*) avoiding chills. It has been proved that, within limits,[6] the lower the temperature the longer can an animal survive without breathing, and the higher the temperature the more quickly it dies. To keep a child in a hot bath until respiration is established is, therefore, a wrong practice. The hot bath can, however, be advantageously used in alternation with the cold bath, but merely as a means of increasing the effect of the cold bath, and in the pale (flabby) stage of asphyxia this also is useless. Under such circumstances it is best to wrap the child in a warm flannel, and not to waste time on baths, but to proceed at once to the establishment of respiration. The application of warm flannels to the head, which is a valuable nervous stimulant in the case of adults, may be advantageously tried in the case of infants, so soon as any signs of reflex action appear, or even possibly earlier.

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[1] Med.-Chir. Trans., 1884, vol. lxvii p. 111.

[2] Reich, Berl. klin. Woch., 1878, No. 37.

[3] Med.-Chir. Trans., 1884, vol. lxvii. p. 107.

[4] Ibid., p. 108.

[5] Ibid , p. 107.

[6] W. F. Edwards, Annales de Chimie, 1818, tome viii. série 2, p. 225.

To sum up the treatment, we may say: Never hurry, it is not a question of seconds, and success depends upon a fine exercise of the judgment. Make a good diagnosis, first, as to life or death; secondly, as to the stage of asphyxia (if life is not extinct). If the child is macerated, it is obviously dead and past hope. If the heart beats, ever so slowly and feebly, it is not dead. If the heart is not beating, death is not certain, unless it can be proved to be inactive for some time. If the child is livid and not flabby, it will probably come round; wipe out its mouth and pharynx, and rub it with a soft cloth down the spine, press gently on the cardiac region. If this produces no effect, inflate the lungs by the mouth, and then by Silvester's method. If air enters the lungs, well and good; if not, try Schultze's method, or insert a catheter, as described above. On the first sign of muscular action, plunge the child into cold water, or into alternate hot and cold baths. Vary the treatment between occasional inflation of the lungs, artificial respiration, pressure over the cardiac region, baths, irritation down the spine, according to the judgment; remembering what may be expected of each method, and that no one will suffice for all cases. Watch for signs of resuscitation, namely, improvement in the color, in movements, in cardiac pulsations, as described above. Never be content until the child breathes regularly, and appears to be continually improving.

Most of the above directions apply to persons apparently drowned. For them, Silvester's method is the best; the air-passages are less likely to be closed, and the mechanism of artificial respiration works better. On the other hand, they have not nearly the tenacity of life of babies, and the hope of recovery in the absence of signs of life is far less.

As regards the parts of the lungs expanded or unexpanded most commonly by artificial respiration, the following are the facts:

(1) The right lung is more usually and more completely expanded than the left. (2) The anterior surfaces are more usually and more completely expanded than the posterior. (3) The apices of the upper lobes are often unexpanded. (4) The same may be said of the anterior inferior borders. (5) One of the places of selection for atelectasis is a strip running vertically along the angles of the ribs on each side of the spine. (6) The patches of expansion or atelectasis, when considerable, are not confined to lobes nor bounded by fissures. (7) The last circumstance is not due to obstruction of the bronchi. (8) The spots of predilection for expansion or atelectasis underlie the regions of greatest and least movement of the chest-walls.[1]

Artificial respiration sometimes becomes necessary after tracheotomy. Under these circumstances, I have proved[2] (1) that emphysema of the anterior mediastinum occurs in a certain number of cases. At the

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[1] Med.-Chir. Trans., 1881, vol. lxiv. p. 100.

[2] Ibid, 1882, vol. lxv. p. 85.

Children's Hospital, in sixteen out of twenty-eight cases in which autopsies had been made after tracheotomy, occurring during two years, or in fifty-seven per cent., emphysema of the anterior mediastinum was found.[1] (2) Emphysema of the anterior mediastinum is often associated with pneumothorax, to which it stands in causal relation, and which may be the cause of death after tracheotomy. In two of the cases above referred to, in which autopsies were held after tracheotomy, pneumothorax was found.[2] It was found in no case without emphysema of the mediastinum. The amount of emphysema of the mediastinum was greatest when pneumothorax existed also. In many, if not in all of these twenty-eight cases, artificial respiration had been performed. (3) The air is most likely to burst into that pleura of which the lung is the less expanded. On the other hand, pneumothorax of course helps to collapse the lung. (4) The route selected by the air is the space beneath the deep cervical fascia. (5) Emphysema of the anterior mediastinum may or may not be associated with emphysema of the neck; but their causes are different, and the conditions of their production are opposite. (6) The conditions favoring the production of mediastinal emphysema are division of the deep cervical fascia, obstruction to the air-passages, and inspiratory efforts. (7) The dangerous period during tracheotomy is the interval between the division of the deep cervical fascia and the efficient introduction of the tube. (8) The incision in the deep cervical fascia should not be longer than necessary in the direction of the sternum. It should on no account be raised from the trachea, and this should be particularly remembered during inspiratory efforts. (9) It will probably be found that the frequency of occurrence of emphysema of the anterior mediastinum depends much on the skill of the operator, especially in inserting the tube. (10) If artificial respiration should prove necessary, the tissues should be kept in apposition with the trachea, and any manipulations performed steadily and without jerks. (11) Schultze's method (which is not otherwise suitable for the above purpose) is especially prone to produce emphysema of the anterior mediastinum. (12) These observations illustrate the fact that, apart from the question of tracheotomy, the inspiratory force of the thorax should be remembered in all operations near the root of the neck, whether dealing with vessels or not, and in the case of all collections of pus beneath the deep cervical fascia. In these cases quiet respiration is essential for the safety of the patient, and vomiting, which begins with a sudden inspiration, is dangerous.

The passage of the air from the tracheotomy wound along the anterior mediastinum illustrates the production of emphysema of the neck during labor and during violent expiratory efforts.[3]

I have proved that (1) the cause of emphysema of the neck during labor is rupture of the lung tissue, the air escaping near the root of the lung, passing beneath the pulmonary pleura into the anterior mediastinum, and so beneath the deep cervical fascia into the neck. The route thus marked is the same by which air sometimes passes into the anterior mediastinum after tracheotomy. (2) The weakest parts of the lungs are opposite the pleural reflections (that is, the fissures) and the interlobular spaces. The anterior surface of the root of the lung is the weakest spot while the lungs are within the thorax, being that pleural reflection lying within the comparatively unsupported area near the upper aperture of the thorax. (3) Pneumothorax, when it occurred during experiment, had nothing to do with the production of emphysema of the neck, and in two experiments was not associated with this emphysema, which thus exactly imitated that occurring during labor. (4) The healthy bronchi and trachea are able to resist the greatest possible expiratory effort.

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[1] Med.-Chir. Trans., 1884, vol. lxvii. p. 102.

[2] Ibid., p. 102.

[3] Ibid., 1885, vol. lxviii. p. 66.

ON DIGITAL EXAMINATION OF THE NASAL CHAMBERS AND DENUDATION OF THE TURBINATED BONES IN THE TREATMENT OF CHRONIC NASAL CATARRH.

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IN the varieties of chronic catarrh in which the discharge is purulent or composed of crusts, the mucous membrane covering the middle turbinated bones will be found to be thickened and softened. In the atrophic form of the disease, the inferior turbinated bone will participate in this condition, and the entire interior of the nose may be lined with membrane which is so far changed from the normal type as to be scarcely recognizable by any of the characters which anatomists employ in its description. I have been for some time in the habit of studying these altered structures as though they were periosteum and bone respectively, and of being guided in their treatment by principles similar to those which are relied upon in treating the diseases of the periosteum and adjacent tissues. In a word, the nasal mucoperiosteum can be divided or removed, the bone can be scraped or excised with freedom and often with advantage.

In order to determine with an approach to accuracy the condition of the interior of the nose, it is well in all cases of chronic catarrh to make a digital examination. It is proposed to conduct the examination in the following manner. The patient being placed under the influence of an anæsthetic, the index finger is inserted into the nostril and by gentle pressure the tip is directed upward and backward in order to